



Commandant
United States Coast Guard

2100 Second Street S.W.
Washington, DC 20593-0001
Staff Symbol: G-OCS
Phone: (202) 267-1313
Fax: (202) 267-4593

COMDTINST 5312.16
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COMMANDANT INSTRUCTION 5312.16

Subj: BOAT CREW UTILIZATION

Ref: (a) USCG Addendum to the National SAR Manual COMDTINST 16130.2 (series)

1. PURPOSE. To establish mandatory station watchstander and boat crew mission hour limits.
2. ACTION. Area and district commanders, commanders of maintenance and logistics commands, commanding officers of headquarters units, assistant commandants for directorates, and special staff offices at Headquarters shall comply with this Instruction.
3. DIRECTIVES AFFECTED. This Instruction modifies boat crew fatigue limits for-standard boats in reference (a).
4. BACKGROUND. Evidence exists to associate a high percentage of mishaps with prolonged operations and crew fatigue. Since fatigue adversely affects operational capability and safety, it is necessary to establish reasonable boat crew utilization criteria.
5. DISCUSSION.
 - a. Fatigued personnel may not realize when their physical or mental state is compromised. A fatigued boat crew is physically and mentally unprepared for the rigors of a mission or to safely manage an underway emergency. They make judgmental errors in boat handling and seamanship and exhibit decreased coordination, a narrowed attention span, and a lower standard of performance. In addition, they show a decreased concern for safety and a willingness to "cut corners."

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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A	2	2	2		2	2	1	2	1	1		1	2	1	1	1	1		1		2					
B	*	8	2		1	1		1		1				100							1					
C	1	1		2	1				10		2			2								5			2	
D	2	1		2				50					2													
E	5		1															5	1							
F																										
G			60	1	10																					
H																										

NON-STANDARD DISTRIBUTION:

- b. Crew Endurance Management (CEM), as described in the enclosure (1) can be used to control fatigue-related decrements in safety and performance. CEM is based on operational experience, analysis of boat crew missions, and a wealth of information derived from a variety of studies on the effects of shiftwork on human performance. The most immediate benefits derived are the reduction of fatigue related mishaps and improved boat crew performance. Although crew endurance is determined by numerous factors including sleep, stress, workload, family, environmental factors, etc., there are five (5) primary factors that can be used to predict fatigue-related crew endurance decrements in operations.
- (1) Time-of-day. Human physiology is programmed to release energy resources during day hours, and replenish these same resources during night/early morning hours. During night operations crews are exposed to increased operational risk and experience reduced energy levels. When possible, night operations should be avoided, and only well rested crews should be authorized to perform these missions.
 - (2) Sleep duration and quality. The average person requires approximately 8 hours of uninterrupted sleep per 24-hour period. Less than 6 hours of sleep per 24-hour period will result in the accumulation of daily sleep debt and produce degradation of alertness, decision-making ability, and mental functions requiring logical ability. Persistent sleep debt throughout a week will result in increased daytime sleepiness and degradation of performance in cognitive and psychomotor tasks. Sleep in noisy, hot, or uncomfortable conditions will be less restorative. Under these conditions, sleep periods of 8+ hours may only restore energy to the 6-hour, or less, level. Restoring energy resources is dependent on sufficient duration and quality of sleep.
 - (3) Stability of sleep/wake schedule. Inconsistent sleep/wake patterns (e.g., waking up early on duty days while sleeping in on non-duty days) will disrupt the biological clock and result in reduced alertness, severe sleepiness, insomnia, degradation of mental alertness, and performance degradation in mental and motor tasks. Emphasis on consistent work schedules will minimize disruptions to sleep schedules and improve crew endurance.
 - (4) Continuous vs. split sleep. Sleep is most restorative when taken in one continuous period. Crews that experience split sleep on a regular basis experience sleep debt and reduced endurance. Certain operational requirements (e.g., bar patrols and escorts at night) produce split sleep, and crew endurance is severely compromised with each successive patrol.

- (5) Period of sustained wakefulness. Crew endurance can be degraded even in operational scenarios when work occurs during daylight hours. During routine duty, periods of work exceeding 12 hours will inevitably result in fatigue and performance degradation. Good quality naps or sleep is the only proven (non-pharmacological) method to maintain endurance within safe levels. If periods of sustained work beyond 12 hours are anticipated, napping should be encouraged and scheduled to maintain appropriate levels of readiness.
- c. Commanders are encouraged to review their operational requirements and personnel scheduling practices using the crew endurance factors to identify crew endurance deficiencies. A working group format, with representatives from each department or work area, is an ideal way to periodically review practices and brainstorm solutions.
 - d. Enclosure (2) provides maximum underway hours. These totals may be an accumulation of several missions (SAR, ELT, MEP, etc.) over a 24-hour period. However, there are occasions, especially during periods of severe weather, where operations will require a long amount of time to complete. In such cases, the prolonged hours and heavy weather will have an accelerating effect on the onset of fatigue as will the amount of time a crewmember has been on duty or working prior to the mission. In evaluating boat crew utilization, operational commanders should consider the cumulative effects of fatigue-inducing factors (heavy weather, temperature, boat motion, etc.), and human factors (motion sickness, survival clothing, changes in sleep and work cycles, work-duty time, etc.).
 - e. These standards are not intended to unduly restrict operational commanders when urgent operations are necessary; they are designed to modify how we pursue missions to increase safety and improve the overall quality of the services provided. No standards can cover every situation that may arise. Common sense and sound judgment must be applied. The operational commander must determine the best course to follow in accomplishing certain urgent missions. It is not intended, except for emergencies, that additional crews be recalled when fatigue limits are reached. Other means of assistance such as, adjacent Coast Guard units, Coast Guard Auxiliary, federal, state, local government or commercial resources should be considered in responding to non-urgent cases.
 - f. Units which cannot comply with operational and training requirements and the intent of the boat crew utilization guidelines without an increase in the unit's personnel allowance, shall bring this information to the attention Commandant (G-OCS) through the chain of command. This information provides operational justification for billet requests. Requests for additional billets which would permit compliance must be specific and fully justified.

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- g. The boat crew scheduling standards in enclosure (2) provide operational commanders maximum underway limits for boat crew personnel in order to maintain mental and physical readiness. Individual benefits derived depend at least in part upon the proper use of off-duty time to ensure good mental and physical condition. It is the responsibility of each boat crewmember to engage only in those off-duty activities that will ensure reporting to duty fully rested.

6. POLICY.

a. General

- (1) Alert crews shall have a minimum of 10 continuous hours of crew rest before assuming alert duty, and 10 continuous hours of crew rest in every 24-hour duty period. Civilian employment during off-duty hours that interferes with or is not compatible with these crew rest requirements is prohibited.
 - (2) Crews that fail to achieve sufficient rest recovery time (i.e., at least a 6 hour sleep period) or who exceed the underway limits in enclosure (2) should not engage in underway operations until they have had sufficient rest-recovery time. Group commanders may waive these standards for urgent operations. When fatigue waivers are granted and fatigued crews undertake missions, the name of the person granting the waiver and the time it was granted shall be noted in the unit's log. SITREPs and other reports shall note that the crew is operating with a waiver.
- b. Duty Rotation. Alert duty periods of 24 hours (i.e., 1-in-3 or better) are strongly encouraged. Operational tempo on duty days often require crews to work long hours throughout the 24-hour day severely disrupting the crew endurance factors discussed above. Under those conditions continuing the duty day beyond 24 hours represents high operational risk.
 - c. Duty Section Relief. Afternoon duty section watch relief (i.e., between 1530 & 1800) provides the greatest benefits with respect to maintenance of sleep/wake schedule stability and reduction of fatigue as a result of sustained wakefulness. For most stations afternoon relief should be the preferred time for duty section relief. Station work prior to duty day will deplete energy resource that may be essential to respond to missions during the duty night. If afternoon relief is not feasible, efforts should be made to protect duty crews during the workday (e.g., use non-duty personnel to respond to calls) thus protecting the energy resources of the duty crew for possible night operational needs.
 - d. Station Work for Duty Crews (assuming afternoon relief):
 - (1) Station work and training should be limited to the period immediately following duty section relief until sometime between 2000 and 2200.

- (2) If the duty crew's sleep is not disrupted for operations, they can be expected to perform normal duty/station work between 0600 and their afternoon relief.
 - (3) If the duty crew is expected to be in a duty status for more than 24 hours, the duty crew's work should be limited to operations and light work or training. Station work other than light work or training and operations should be limited to the period between 0600 and duty section relief on the final duty day.
- e. Station Work for Duty Crews (assuming morning relief). Duty crews should be restricted to light operations, training, or station work except as required for direct operations support for the entire duty period.
- f. Underway Limits:
- (1) Enclosure (2) provides the maximum underway hours a crew may accumulate within any 24-hour period without being required to enter a rest-recovery status. Missions shall not be scheduled to exceed these limits. Crews that exceed the limits while underway may complete their mission before being required to enter a rest-recovery status.
 - (2) These totals may be the result of a single mission or an accumulation of several missions (SAR, ELT, MEP, OPTRA, etc.) during the 24-hour period.
 - (3) Operational commanders should consider the cumulative effects of fatigue-inducing factors (heavy weather, temperature, boat mission, station work, etc.), and human factors (motion sickness, survival clothing, changes in sleep and work cycles, work-duty time, etc.) when evaluating mission risk and the ability of crews to perform effectively and safely.
 - (4) These fatigue standards are not intended to preclude the use of boats. Commanding Officers/Officers-in-Charge should not be reluctant to get boats underway on normal operations and training for fear of compromising the boat crew's availability.
 - (5) When a station's alert posture is compromised due to crew fatigue, a Crew Fatigue Message (samples provided in enclosure (3)) shall be sent. When the fatigue situation has cleared due to a relief crew reporting aboard or the duty crew having sufficient crew rest, a message referencing the fatigue message stating that operations are normal shall be sent. Whenever a Group Commander waives the established boat crew utilization limits, the appropriate District Command Center shall be advised of the situation and the actions taken. (Note: The implementation of a Coast Guard-wide Readiness System will eliminate the need for these messages.)

g. Sleep Debt:

- (1) Individual readiness is a personal responsibility. This is especially true with obtaining sufficient sleep and avoiding fatigue as individuals are the best judges of the extent and quality of their own sleep periods. This sub-paragraph provides guidelines designed to assist individuals and unit commanders in assessing and managing individual readiness and opportunities for sleep periods. Unit commanders should provide crews the opportunity to obtain the sleep periods discussed below. Subsequent to these opportunities, individual must advise their commands if they believe their personal readiness to be compromised.
- (2) Any mission occurring between 2300 and 0500 should be considered "Higher Risk" because it interrupts crew's normal physiological cycles. At the conclusion of such missions, the sleep period required to ensure the crew is sufficiently rested for a subsequent mission will depend upon the length of the sleep period achieved (if any) before the mission.
- (3) For missions that begin or end between 2300 and 0500, if the boat crew has had:
 - (a) Less than a six-hour sleep period - they need at least a six-hour sleep period to control fatigue on subsequent missions.
 - (b) More than a six-hour sleep period but less than a seven-hour sleep period - they need at least a two-hour sleep period to control fatigue on subsequent missions.

If Initial Sleep Period:	Additional Sleep Period Needed:
0-6 Hours	6+ Hours
6-7 Hours	2+ Hours

7. PROCEDURES. Unit commanders shall comply with the policies set forth in this Instruction. These requirements shall be taken into consideration when developing standard staffing for boat operations.

TERRY M. CROSS
Assistant Commandant for Operations

Encl: (1) Definitions

- (2) Maximum Underway Limits
- (3) Example Message Formats

DEFINITIONS

For this instruction the following standard definitions are to be utilized:

- a. Alert Duty - A person is on alert duty when engaged in underway operations or is on SAR readiness standby, with a boat response time of 30 minutes or less.
- b. Boat Crew - Includes the coxswain, boat engineer, crewmen, and all other personnel required on board a boat acting in an official capacity.
- c. Crew Endurance Management (CEM) - A systematic process for balancing organizational (e.g., 24/7 operations, number of B-0 resources, etc.) and mission (e.g., environmental factors, time-of-day, etc.) requirements with the physical and mental capabilities and needs of the crew. CEM uses a systems approach to evaluate the effects of all the factors, and interaction of these factors, to control adverse effects, like fatigue, of our operations.
- d. Crew Rest - Time during which alert crews do not engage in any station work or operations. Crews are allowed to recreate and sleep.
- e. Crew Underway Time - Begins when the crew member reports to the designated place to prepare for a specific boat mission. Computation of such time ends when the mission is complete. Crew underway time includes time spent accomplishing pre-mission and post-mission boat checks.
- f. Extended Alert Duty - A person is on extended alert duty when assigned for more than 24 hours. Generally, this occurs as the result of 48 or 72-hour duty weekends.
- g. Fatigue - A condition of impaired mental and physical performance brought about by extended periods of exertion and stress which reduces the individual's capability to respond to external stimuli. Some factors contributing to fatigue are sleep loss, exposure to temperature extremes (hypothermia and heat stress), motion sickness, changes in work and sleep cycles, physical exertion, workload, illness, hunger, and boredom. While an individual or crew may be considered to be fatigued at any time, at a minimum, they are considered to be fatigued when they exceed the underway or alert posture standards in this chapter.
- h. Fatigue Waiver - A waiver to crew rest or rest-recovery requirements granted by a Group commander.
- i. Heavy Weather - Wind speed of 30 knots or greater, or continuous wave height greater than 8 feet.

- j. Operations - Time spent on pre-mission planning, underway, and post mission reporting or follow-up.
- k. Rest-Recovery Time - That period of time after operations and/or station work which is allocated for rest and recovery and during which no other duties are assigned or performed. Any combination of off-duty time and standby duty may make up rest-recovery time. Rest-recovery time does not necessarily allow the individual to go home or otherwise leave the bounds of the unit.
- l. Sleep Period - A period of time available for an individual to devote to sleeping that is not interrupted by official responsibilities.
- m. Standby Duty - A person is on standby duty when in a liberty status, but subject to recall to proceed on a mission as soon as the need is known, with a boat response time of two hours or less after notification.
- n. Station Work - Activities that constitute normal unit work which are not directly associated with duty, boat operations, pre-mission planning, or post-mission reporting and follow-up. Ex: boat maintenance, station clean up, non-mission administrative tasks.
- o. Urgent Operations - A mission of sufficient importance that district commander elects to execute it with a fatigued boat crew.
- p. Urgent SAR - A mission which involves the probable loss of life unless the Coast Guard intervenes.

MAXIMUM UNDERWAY LIMITS

BOAT TYPE	MAXIMUM UNDERWAY HOURS ₁			REST
	Seas < 4 ft	Seas > 4 ft	Heavy WX ₂	Required ₄
44', 47', 52' MLB	10	8	6	8
41' UTB	10	8		8
49' BUSL/55' ANB ₃	10	8		8
SRB	8	6	4	8
Other/Non-Standard<30'	8			8
Other/Non-Standard>30'	8	6		8
<p>Notes:</p> <ol style="list-style-type: none"> 1. Maximum hours within a 24 hour period. 2. Heavy weather is defined as wind speed of 30 knots or greater, or continuous wave height greater than 8 feet. 3. Time spent at a sheltered anchorage can reduce the maximum underway hours for crew on watch by 50%. Time at a sheltered anchorage need not be counted for crew not on watch. 4. A minimum of 10 continuous hours of crew rest is required in every 24 hour duty period (Para.6.a.(1)). 				

EXAMPLE MESSAGE FORMATS

1. Fatigue Situation. Units unable to respond to any mission other than urgent SAR, should send the following message:

0
FM UNIT
TO GROUP COMMANDER
INFO CCGDXXX
ADJACENT UNITS (See Note)
BT
UNCLAS//N16130//
SUB J: SAR RESPONSE
1. UNABLE TO RESPOND ANY MISSION OTHER THAN URGENT SAR DUE TO
BOATCREW FATIGUE. ANTICIPATE OPS NORMAL (LOCAL TIME).
BT

2. Cancel Fatigue Situation. When the boatcrew fatigue situation no longer exists, a follow-up message to that effect should be sent.

0
FM Unit
TO GROUP COMMANDER
INFO CCGDXXX
ADJACENT UNITS (See Note)
BT
UNCLAS//N16130//
SUBJ: SAR RESPONSE
A. MY
1. OPERATIONS NORMAL.
BT

Encl (1) to COMDTINST 5312.16

3. Urgent SAR. Whenever an operational commander waives the established boat crew limits the district commander should be advised of the situation and the actions taken. Such notification would best be done in conjunction with the first SITREP.

0

FM GROUP COMMANDER

TO CCGDXXX

BT

UNCLAS //N16130//

SUBJ: DISTRESS SITREP ONE - P/V IN TROUBLE (UCN-###)

1. SITUATION

A. (DESCRIPTION OF SITUATION)

2. ACTION TAKEN

A. BOAT CREW LIMITS WAIVED FOR URGENT SAR. MLB 44XXX UNDERWAY
WITH COXSWAIN BM3 A. B. CEE; ENGINEER MK3 X. Y. ZEE; AND, CREWMEN
SN L. M. KAY AND SN E. F. GEE.

3. FUTURE PLANS.

BT

NOTE: If an adjacent unit is in a different group and/or district, add that respective group and/or district as an info addree.